

Automobile speed limiting device with intervention perceptible to driver

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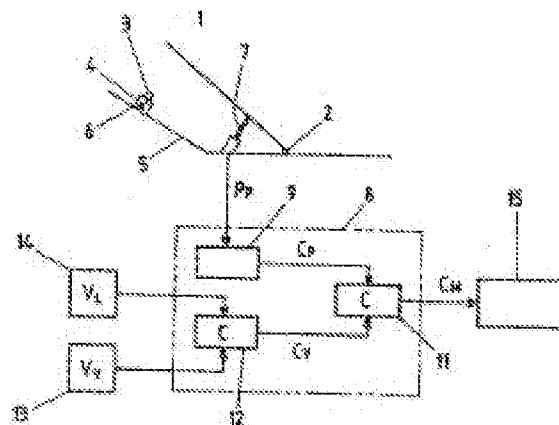
EP0021935 (A1)

US5514049 (A)

FR2441509 (A1)

Abstract of **FR 2755650 (A1)**

The angular depression of the accelerator is monitored by a position sensor (7), whose output the controller (8) transforms (9) to a torque signal (C_p). The vehicle speed sensor's (13) output (V_v) is compared (12) with an adjustable (14) reference setting (V_l). The result, expressed in torque terms (C_v), is compared (11) with the pedal-related torque (C_p), the comparator output being used (15) to vary the engine torque. Below the set limit, the output signal (15) directly reflects the driver's applied pedal position, but when the set speed limit is reached the controller maintains this value. Depressing the pedal further brings it against a spring-loaded (6) stop (3). The driver perceiving resistance, then has an over-limit option with further pressure.



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Limiting device speed of a motor vehicle, whose action is perceived by the driver.

The present invention refers to the limiting device speed of a motor vehicle. A limiting device speed prevents the driver of the vehicle from exceeding a maximum speed, moreover adjustable, except passing in addition to deliberately to the imposed speed limit, by the limiting device, but makes it possible the driver to choose the speed which it wishes below the speed limit, unlike a speed regulator which imposes a speed given without possibility of going less quickly.

One knows already a limiting device speed of motor vehicle. It comprises an accelerator pedal. By accelerator pedal one understands, in the present report, not only one body intended to be operated for the foot, but also any other power control being able to be operated by the driver of the motor vehicle and allowing to make it accelerate. The limiting device comprises means giving to the pedal a first active race up to a hard point, then one second active race beyond the hard point. These means comprise for example a position encoder of the pedal, whose information of position can be transformed into a signal of couple due to the pedal, which will be below called signal of couple pedals, a control device of engine torque, a real velocity pick-up of the vehicle and device ready to prescribe a speed limit with the vehicle. A calculator compares the real speed of the vehicle at the limiting speed to deduce a signal from it from couple due to the regulation speed. This signal of couple is a function of the difference between the speed limit and real speed. The calculator compares moreover this signal of couple due to the regulation speed, which will be below called signal of couple speed, with the signal of couple pedals and sends a control signal of couple to the control device of couple according to the comparison between the signal of couple speed and the signal of couple pedals.

This limiting device speed supposes to apply to the accelerator pedal a resistant effort in an unspecified position of the pedal.

That can be carried out only using one jack which requires in its turn an electric motor. Moreover, the position of speed limit felt on the pedal by the driver is variable according to speed limits selected.

The invention mitigates these disadvantages by a limiting device speed much simpler to manufacture than the former limiting device. Moreover, the driver always feels a hard point on the accelerator pedal in the same position of the pedal.

According to the invention, the aforementioned means are arranged so as to give to the pedal a race died between the first active race and the hard point, and the hard point appears in a fixed point of the way of the pedal, whatever the speed limits selected.

⚙ top To dissociate the position of the pedal corresponding to the speed limit and the position of hard point of the pedal felt by the driver makes it possible to fix the hard point in a given position of the travel of the pedal, since one now has the possibility of varying the position of the pedal corresponding to the speed limit. This dissociation also makes it possible to exempt jack and of what it supposes of complexity of manufacture to replace it, for obtaining the hard point, by a simple pushbutton recalled by a spring and in contact with the back of the pedal when this one described the way bringing it to the hard point.

In a mode of realization, the pushbutton, recalled by a spring, is assembled so as to thwart the displacement of the pedal au-delà of a position corresponding to a signal of couple pedals maximum, the calculator sending a control signal of couple, which corresponds to smallest of the signals of couple speed and of couple pedals as much as the pedal is in on this side this position and with largest of both beyond this position given.

With the annexed drawing, only given as example: figure 1 is a diagrammatic sight of the limiting device speed according to the invention, while Figure 2 is an explanatory graph giving the engine torque according to the position of the pedal.

Pedal 1 of accelerator of a motor vehicle can swivel around a fulcrum pin 2 until its back comes in contact with stem 3 mobile from a button 4 push rod fixed at floor 5 from the vehicle. Stem 3 is pushed back towards pedal 1 by a spring 6.

A sensor 7 is ready to detect the angular position of pedal 1. It provides this information of position to a calculator 8 whose program is schematized on Figure 1. An element 9 transforms information EP of position of the pedal into a couple pedals CP which is sent to a comparator 11.

Another comparator 12 of calculator 8 compares a signal corresponding at the real speed of the vehicle and coming from a sensor 13 the speed of the vehicle and a signal corresponding at the limiting speed of the vehicle and coming from a device 14 ready to prescribe a speed limit with the vehicle.

Comparator 12 sends to comparator 11 a signal of couple speed Cv, which is a function of the difference between the speed limit and real speed. Comparator 11 compares the couple pedals CP and the couple speed Cv. According to the couple pedals and of the couple speed which it receives, comparator 11 sends to a device 15 of ordering of couple of the engine of the vehicle a signal CM of ordering of couple.

Line I in long indents on Figure 2 represents the couple speed CV. Curve II in short indents represents the signal of couple pedals CP and curve III in feature full the signal with engine torque CM.

One can deduce from Figure the 2 way in which the engine torque is defined according to the position of the pedal.

For a couple speed Cv given, it corresponds a position statement of the pedal on section A of the courbe III. The driver which presses on pedal 1 causes an increase according to curve A of the engine torque CM, since CP is lower than Cv and that consequently, element 11 provides a signal of engine torque CM equal to CP.

Beyond the point B of co-ordinates statement-Cv, the limiting device speed enters in action, so that the engine torque CM is maintained with the value of

Cv, since the calculator sends a control signal of couple which corresponds to smallest of the signals of couple speed Cv and of

couple CP pedals and since C_v are smaller than CP. That makes it possible to maintain the speed of the vehicle at the prescribed limiting speed. Since the point B, the pedal has a dead race.

With X-coordinate PKD, corresponding to the point where pedal 1 comes in contact with stem 3, the driver starts to feel a hard point. CP arrives at 100% of its value on curve II when pedal 1 is in the position corresponding to PKD, but, with this X-coordinate, CP decrease abruptly up to zero, before growing again linearly.

In a point C on curve I correspondent with a X-coordinate PC higher than PKD, the position of pedal 1 is again taken into account, because CP becomes again higher than C_v , which makes it possible to exceed the speed limit, since, beyond point PKD, the calculator sends a control signal of couple corresponding to largest of the two signals CP and C_v and that, in this case, beyond the point C, it is again CP which is larger than C_v . It is the second active travel of the pedal.



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CLAIMS

1. Limiting device speed of a motor vehicle including/understanding a pedal (1) of accelerator and means (7,8) giving to the pedal (1) a first active race up to a hard point, then one second active race beyond the hard point, characterized in that the aforementioned means (7,8) are arranged so as to give to the pedal (1) a race died between the first active race and the hard point, and in what the hard point appears in a fixed point of the way of the pedal (1), whatever the speed limits selected.
2. Limiting device following claim 1, characterized in that the hard point is obtained using a pushbutton (4,5) recalled by a spring and in contact with the back of the pedal (1) when this one described the way bringing it to the hard point.
3. Limiting device following claim 2, in which the aforementioned means include/understand a sensor (7) of the position of the pedal (1), a calculator transforming the information of position of the sensor (7) into a control signal of couple of the engine of the vehicle called signal of couple pedals, a real velocity pick-up of the vehicle, a device ready to prescribe a speed limit with the vehicle, the calculator comparing real speed (Vv) vehicle at the limiting speed (VL) to deduce a signal from it from couple speed (Cv) which is related to ia difference between the speed limit (VL) and speed real and comparing this signal of couple speed (Cv) to the signal of couple pedals (CP) and sending a control signal of couple (CM) to the device (15) of ordering of couple according to the comparison between the signal of couple speed (CV) and the signal of couple pedals (CP), characterized in that the pushbutton (4, 5), recalled by a spring (6), is assembled so as to thwart the displacement of the pedal (1) beyond of a position corresponding to a signal of couple pedals (CP) maximum, the calculator (8) sending a control signal of couple, which corresponds to smallest of the signals of couple speed (Cv) and couple pedals (CP) as long as the pedal (1) is in on this side this position and with largest of both audelà of this position given.
4. The application of a push-button recalled by a spring to obtain a hard point in a limiting device speed of motor vehicle.

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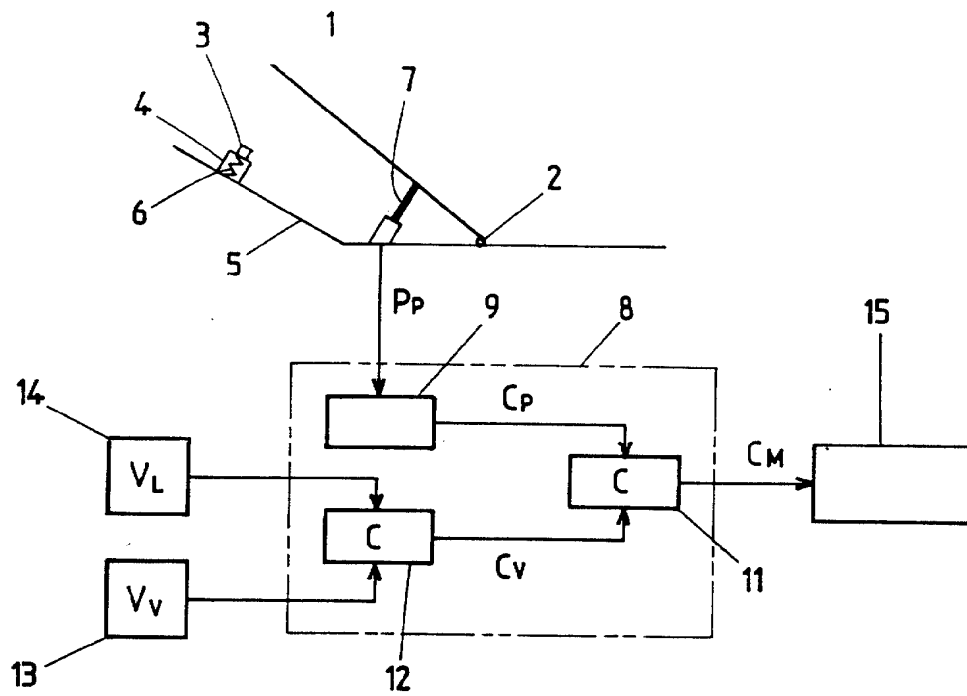


FIG-1

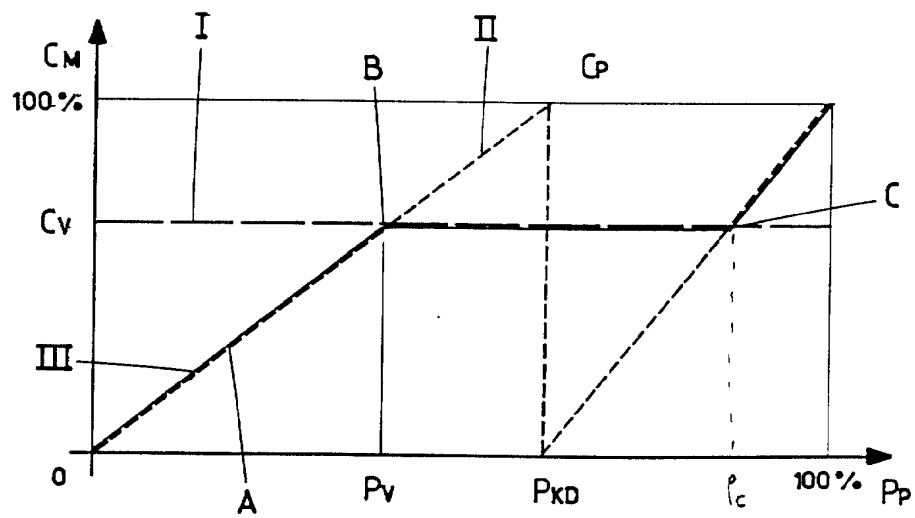


FIG-2

